significant delays, plus severe traffic congestion on the ground making the ground trip to the airport equally hectic. A VTOL airplane can operate from a number of vertiports scattered around numerous sub-urban locations of a metroplex thus making air travel much more rapid and convenient. The high speed and high maneuverability of the single-tilt-rotor VTOL airplane along with its low cost also make it ideal for military applications replacing the slower and more vulnerable army attack and army transport helicopters. Its high speed and long range including long loitering time make it ideal for coast guard, border patrol or drug interdiction duties, as well as search and rescue, and virtually any roles filled by the helicopters. While I have shown and described in considerable details what I believe to be the preferred form of my invention, it will be understood by those skilled in the art that the invention is not limited to such details but may take various other forms within the scope of the claims that follow.

What is claimed is:

1. In a VTOL airplane capable of a vertical takeoff and landing mode (VTOL), an autorotation mode wherein the airplane is capable of a steep but controlled and safe descent by means of a large-diameter lift rotor in an absence of engine power, as well as an efficient high-speed horizontal cruising mode, the combination comprising:

a pair of wings disposed on opposing lateral sides of the airplane for supporting the airplane in the horizontal mode, said wing having a wing tip and a wing root,

a horizontal stabilizing surface and a vertical fin disposed at a tail end of the airplane for providing necessary aerodynamic stability,

a fuselage having a top, a bottom, a front section, a tail section and a longitudinal axis forming a center line running from the front section toward the tail section,

means for controlling said airplane in the VTOL mode and in the autorotation mode in all three typical pitch, roll, and yaw axes,

means for controlling said airplane in the horizontal cruising mode typical for a conventional airplane, comprising of ailerons, rudders and elevator.

vertical lifting means comprising of :

at least one tiltable lift rotor mounted on top of a power pod having a significant length, said tiltable rotor having a pluriality of elongated and slender rotor blades radially arranged around a tiltable rotor axis, said rotor axis traverses the length of the power pod, said tiltable rotor axis is tiltable between a vertical orientation for providing vertical lift in the

VTOL mode, and a horizontal orientation, for use in the horizontal cruising mode, wherein said main rotor blades are disconnected from power and are allowed to rotate at a minimum rotational rate generally sufficient for maintaining structural integrity of the rotor blades in spite of strong force of relative wind in a high-speed cruise,

rotor transformational means for transforming the orientation of said tiltable lift rotor between the vertical orientation and the horizontal orientation,

engine powering means connected to said power pod, said power pod having a top end mechanically connected to said main rotor for powering said main prop-rotor, said power pod is pivotably mounted to a structure of the airplane allowing tilting motion of said rotor,

means for disconnecting said engine powering means from said main tiltable rotor, for use in the horizontal cruising mode, wherein said main rotor blades are allowed to rotate at said minimum rotational rate whereby significant drag reduction and rotor blade integrity can be maintained,

horizontal propulsion means structurally separated from said tiltable rotor for providing horizontally-oriented thrust for use in the horizontal cruising mode, whereby higher cruise efficiency can be obtained than if said tiltable rotor is also used as horizontal propulsion means.

2. The VTOL airplane of claim 1 wherein the tiltable lift rotor has the rotor axis tiltable generally in a vertical plane containing the longitidinal axis of the fuselage, between a vertical orientation wherein said tiltable rotor rises above the fuselage for providing vertical lift in the VTOL mode, and a horizontal orientation whereby said tiltable rotor blades protrude in front of the fuselage's front section, for use in the horizontal cruising mode, said lift rotor creates a substantial reactional rotational torque to the fuselage necessitating an anti-torque means disposed at a significant distance from the lift rotor's rotational axis to counteract said rotational torque.

3. The VTOL airplane of claim 2 wherein said rotor transformational means is comprised of :

pivoting means for pivoting the rotational axis of said main rotor on a pivoting axis on a transverse relationship with respect to the fuselage, thereby varying a direction of lift from the main rotor with respect to the fuselage

translating means for moving said main rotor with respect to the fuselage with a fore-and-aft vector component along the longitudinal axis of the fuselage, thereby allowing the

main rotor to be moved significantly forward to be in front of the fuselage when said main rotor assumes the horizontal orientation for proper clearance of the rotor blades from the fuselage, and allowing said main rotor to be moved significantly rearward when said main prop-rotor assumes the vertical orientation for proper balancing of vertical lift during a vertical take off, and,

coordinating means for coordinating said pivoting means and said translating means into one control function for convenience and for preventing the rotor blades from inadvertently striking the fuselage.

4. The VTOL airplane of claim 3 wherein the translating means for sliding the main rotor forward and backward with respect to the fuselage further comprising:

a streamlined base whereupon the power pod of the main rotor is pivotably attached to, said base is slidable on top of the fuselage by riding on

a pair of parallel guide beams having a central slot, said guide beam is firmly attached to the top of the fuselage on each lateral side to the longitudinal axis of the airplane,

a pair of metallic shoes each supporting a lower end of said base, said shoe is slidingly fitted within the central slot of said guide beams and is lubricated for low-friction sliding motion,

motive means for powering the sliding action of said base and said power pod thereby resulting in translational motion of the main rotor with respect to the fuselage.

5. The VTOL airplane of claim 4 wherein there is provided locking means for tightly locking the metallic shoes with respect to the guide beams thereby preventing translational motion and potential vibration between adjoining parts.

6. The VTOL airplane of claim 4 wherein the pivoting means for the main rotor is further comprised of a telescopic actuator hingedly attached to the power pod and to the streamlined base.

7. The VTOL airplane as defined in claim 1 and claim 2 wherein the tiltable lifting rotor blade has a built-in degree of blade twist from root to tip, said degree of blade twist is set to be significantly lower than the typical blade twist of a typical airplane propeller in cruise, thereby resulting in significantly increase in efficiency in both the VTOL mode and the autorotation

mode.

8. The VTOL airplane as defined in claim 7 wherein the engine powering means is comprised of an internal-combustion engine, the combination further comprising:

a horizontally-oriented propeller of significantly smaller size than the main rotor, said propeller is powered by said engine thereby serving as horizontal propulsion means,

transmission means connecting said engine to said main rotor for providing vertical lift to the airplane during the VTOL mode,

clutch means disposed between said engine and said transmission for connecting and disconnecting said engine to said rotor in the VTOL mode and both the horizontal cruising mode and autorotation mode, respectively, thereby improving efficiency in all threee mode of VTOL, cruising, and autorotation.

9. The VTOL airplane as defined in claim 8 wherein the engine is fixedly attached to the fuselage behind the wing, thereby reducing noise and vibration to the airplane's cabin.

10. The VTOL airplane of claim 2 wherein the anti-torque means comprising:

a tail rotor comprising of a propeller oriented perpendicular to the airplane's longitudinal axis and is disposed at the tail section of the airplane,

a drive shaft for transmitting power from the engine to the tail rotor,

clutch means for engaging said tail rotor to the engine in the VTOL mode and for disengaging said tail rotor from said engine in the horizontal cruising mode.

11. In a VTOL airplane capable of a vertical takeoff and landing mode (VTOL) as well as an efficient horizontal cruising mode, the combination comprising:

a pair of wings disposed on opposing lateral sides of the airplane for supporting the airplane in the horizontal mode, said wing having a wing tip and a wing root,

a horizontal stabilizing surface and a vertical fin disposed at a tail end of the airplane for providing necessary aerodynamic stability in horizontal cruising mode,

a fuselage having a top, a bottom, a front section, a tail section and a longitudinal axis forming a center line running from the front section toward the tail section,

means for controlling said airplane in the VTOL mode in all 3 typical pitch, roll and yaw axes,

means for controlling said airplane in the horizontal cruising mode typical for a

conventional airplane, comprising of ailerons, rudders and elevator.

vertical lifting means comprising of :

a main tiltable rotor mounted on top of a power pod having a significant length, said main rotor having a pluriality of elongated rotor blades radially arranged around a main rotor axis, said main rotor axis traverses the length of the power pod, said main rotor axis is tiltable generally in a vertical plane containing the longitudinal axis of said fuselage, between a vertical orientation wherein said main rotor rises above the fuselage for providing vertical lift in the VTOL mode, and a horizontal orientation whereby said main prop-rotor blades protrude in front of the fuselage's front section, for use in the horizontal cruising mode,

translating means for sliding the main rotor forward and backward with respect to the fuselage to allow for clearance of the rotor from the front section of the airplane, further comprising:

a streamlined base whereupon the power pod of the main rotor is pivotably attached to, said base is slidable on top of the fuselage by riding on

a pair of parallel guide beams having a central slot, said guide beam is firmly attached to the top of the fuselage on each lateral side to the longitudinal axis of the airplane,

a pair of metallic shoes each supporting a lower end of said base, said shoe is slidingly fitted within the central slot of each of said guide beams and is lubricated for low-friction sliding motion,

motive means for powering the sliding action of said base and said power pod thereby resulting in translational motion of the main rotor with respect to the fuselage.

pivoting means for the main rotor for tilting of said rotor between the vertical orientation and the horizontal orientation,

engine powering means connected to said power pod, said power pod having a top end mechanically connected to said main rotor for powering said main prop-rotor, said power pod having a lower end pivotably connected to a structural member of the fuselage, said powering means generates a reactive torque in the yaw axis on the fuselage as a resulting of turning said main rotor in the vertical orientation,

yaw-control means for countering said yaw-axis reactive torque effect from said power means, and,

horizontal propulsion means for providing horizontally-oriented thrust for use in the horizontal cruising mode.

12. The VTOL airplane of claim 11 wherein there is provided locking means for tightly locking the metallic shoes with respect to the guide beams thereby preventing translational motion and potential vibration between adjoining parts.

13. The VTOL airplane of claim 11 wherein the pivoting means for the main rotor is further comprised of a telescopic actuator hingedly attached to the power pod and to the streamlined base.